How Sustainable is the Latest CAP Reform Under Possible Trade Liberalisation Outcomes of the Doha Round?

W. Britz[1], T. Heckelei[1], F. Junker[1], I. Pérez[1], C. Wieck[2]

[1] Institute for Agricultural Policy, Market Research, and Economic Sociology, University of Bonn

[2] IMPACT Center, Washington State University

Paper prepared for the IATRC Summer symposium

"Pressure for Agricultural Reform:
WTO Panels and the Doha Round Negotiations "

Sevilla, Spain, June 19-21, 2005

Abstract

The CAP Reform of 2003 is a further step of the EU on its path towards a higher market orientation of European farmers. One of the motivations behind this reform process is to prepare the Common Agricultural Policy for further trade liberalisation. However, the sustainability of the EU reform policy might be challenged by a strong Euro that can negatively affect the competitiveness of European exports and result in increasing domestic market pressure.

In this paper the sustainability of the European agricultural policy is analysed under different economic framework conditions and Doha round outcomes. The analysis is based on a quantitative modelling system covering the agricultural sector of the EU-25 combined with a world-wide trade module. The Harbinson proposal, complete elimination of export subsidies, a strong Euro, and a combination thereof are simulated.

The results show that the latest CAP reform was a quite successful step to render the CAP compatible with further trade liberalization. Given the still high level of EU's border protection in many agricultural markets, considerable reductions in market prices cannot be avoided when market access is improved. Depending on the exchange rate development, administrative prices in some markets may not be defendable and losses of agricultural income in the range of -13% to -20% are to be expected from these price changes. However, a larger part of the income losses will show up in lower land rents. The agricultural income losses are offset by increased welfare of consumers and processors leaving the EU with a considerable welfare gain.

Keywords: CAP reform, Doha negotiations, financial discipline, exchange rate, quantitative modelling

Acknowledgement

The CAPRI model is and has been financially supported by several research framework programs of the European Commission (FP 4 to FP 6). The authors want to thank for the work done by other project partners in the development of the different parts of this modelling system.

How Sustainable is the latest CAP Reform under the possible Trade Liberalisation Outcomes of the Doha Round?

W. Britz, T. Heckelei, F. Junker, I. Pérez, C. Wieck

1 Introduction

1.1 The Trade Liberalisation Negotiations: Past, Present and Future

In 1994 the Uruguay round came to an end and significant trade liberalisation compromises were agreed upon by World Trade Organization (WTO) members, for the first time also for agricultural products. The Uruguay round targeted mainly three trade-distorting instruments: import barriers, domestic support, and export subsidies, differentiated with respect to industrial and developing countries. This was, however, only a milestone in the long path of reform to come. In November 2001 the Doha Ministerial Declaration set a new mandate for further trade liberalisation continuing the path of reform taken with the Uruguay Agreement on Agriculture.

Not at least to comply with the expected outcome of the Uruguay round, the reform of the Common Agricultural Policy (CAP) of the EU in 1992 represented a significant shift from price to direct income support. The 'Agenda 2000' reform continued this path with further cuts in administrative prices and increased premiums while harmonising payments in the cereals and oilseeds sector. At the same time, financial discipline measures defined medium-term ceilings on the EU agricultural budget. The latest CAP reform adopted by Member States in September 2003 (Council of the European Union 2003) and to be implemented gradually in the 2005-2012 period introduces further decoupling of domestic support for cereals, oilseeds, pulses, beef, sheep and goat meat. The reform package was extended in 2004 to cover former coupled payments for olive oil, tobacco, textile crops and nuts (European Commission 2004a). This reform aimed at stronger market orientation of European farmers, including the hope to render the CAP compatible with further trade liberalisation steps. The EU's decoupling scheme is expected to lower production in marginal areas where it was induced in the past by coupled support. Supply reduction of comparatively strongly subsidised products under the old regime will lead to higher market prices for cereals or beef, as long as size and frequency of intervention purchases or exports with subsidies remain unchanged. Reduction in administrative prices of dairy products compensated by additional decoupled premium payments are part of the same reform package and further lower the protection level in this sector. These expected developments certainly improves the EU negotiating position with regard to further discipline on border protection and export subsidy measures and also reduces of the use of amber and blue boxes for domestic support.

1.2 Motivation of the Paper

With this CAP reform now being implemented it seems important to look at its sustainability under possible outcomes of the WTO Doha round: How big is the price pressure into EU markets? Will regular market interventions be necessary to defend administrative prices? What are costs of these interventions and do they imply cuts in premiums given the current budgetary discipline restrictions in the EU? Will administrative prices still act as a price floor when only defended with intervention purchases and not with export subsidies? How will the contribution of agriculture to income in rural areas develop under the price pressure? Will substantial parts of land be abandoned? Answers to these questions are not easy, as they depend on how effectively the results of the current WTO round impacts on the EU's complex agricultural border protection, and how EU import and export prices develop in a more liberal trade environment.

For any given liberalisation scenario, key factor for future development are exchange rates as seen by the (unexpected) recent increase in market pressures resulting from a strong Euro (European Commission 2005a). Depending on the tariff reductions being agreed upon, the strength of the Euro also determines import quantities at MFN and preferential tariff rates. Both, reduced export opportunities and increased import quantities with the resulting drops in market prices and agricultural income may strengthen the position of those asking for unchanged agricultural support in the EU and thus opposing a significant re-orientation of the EU budget towards rural development programs, or even more ambitious shifts towards R&D as recently advocated by some member countries.

Beside price effects, agricultural income in scenarios is further affected by the newly introduced mechanism of financial discipline implying a cut of direct payments if an overshooting of the CAP budget is forecasted. With given budget ceilings in the premium programs, an overshooting could only be provoked by export subsidies or market interventions. Thus, the future premiums depend to a certain extent on market price developments in the EU and on world markets: if administrative prices will be defended by intervention purchases or export subsidies, the related costs may trigger a decrease in premiums.

Given these interlinked challenges for the new CAP, this paper analyses the sustainability of the latest CAP reform under different economic framework conditions ($/€ exchange rates) given an assumed outcome of the Doha round characterised by tiered reductions of import tariffs, increased market access under Tariff Rate Quotas (TRQs), and a reduction/elimination of export subsidies.[1] The analysis is based on quantitative modelling results and focuses on budgetary effects, consumer welfare, farm income, intervention stocks, and more disaggregated indicators such as the rate of land

[1] Note that we assume in the framework of this analysis no further reduction of domestic support besides the introduction of the EU reform package of 2003 is foreseen.

abandonment in marginal agricultural regions. Despite the use of a global market framework, the main emphasis is on EU results.

The paper is organised as follows. The next section provides an overview on the main restrictions that limit the scope for market interventions of the EU. In sections 3 and 4 the model used is described and a scenario overview provided. Selected model results are presented in section 5. In a final resume, the sustainability of the CAP under the analysed scenarios will be discussed.

2 Financial and Quantitative Limitations of the CAP and Effects of Exchange Rates

In principal, there are three mechanisms to restrict interventions on European agricultural markets: Ceilings on the CAP budget (financial discipline), limits on export competition measures resulting from the Uruguay round, and limits on domestic support laid out in European legislation such as maximum intervention purchases. In this section, we will briefly discuss only the first two issues as all ceilings on domestic support are indirectly captured by the financial discipline mechanism of the CAP. Furthermore, we present a short overview on the relationship between exchange rates and intervention purchases.

2.1 The CAP Financial Discipline Mechanism

Additionally to the introduction of the Single Farm Payment, the CAP reform 2003 included a cap on budgetary expenditure on the "first pillar" of the CAP. In this pillar, the costs of the Common Market Organisations (CMOs) are comprised, i.e. direct payments and all types of market support (intervention purchases, export subsidies and further subsidies, e.g. to promote processing). Whereas the costs for the different direct payment schemes are fixed ex-ante in legal acts, in most markets neither costs nor quantities of intervention purchases are restricted by the CMOs so that the related expenditures depend on future market developments[2]. Given past experience of exploding intervention stocks ("butter mountains") and the high volatility of both world market prices and the Euro exchange rate, the introduction on the total CAP budget was a rational decision of the Council of Ministers. The Council went even a step further by setting clear rules on how to enforce the ceiling, in order to avoid future tedious re-negotiations and new legislation to adjust the CMOs when responding to market situations provoking high intervention costs. This newly introduced financial discipline thus combines ceilings with mechanisms to adjust budget positions and is laid out in the council regulation 1782/2003: "[…] an adjustment of the direct payments shall be fixed when the forecasts indicate that

[2] Note, that intervention in dairy markets is the most prominent exception as explicit upper limits for intervention purchases are defined in the reform package of 2003. However, even here, a „backdoor" for market intervention

the amounts foreseen under subheading 1a[3] taking into account a margin of 300 Mio € below the amounts foreseen and before application of modulation […] will be exceeded in a given budget year" (Council of the European Communities 2003). In other words, direct payments will be cut if the expenses for the CAP exceed a fixed budget, which introduces a new degree of flexibility into the amount of money spent on premium payments.

In detail as presented in Table 1, the CAP budget for the first pillar is fixed at 43.7 Mio € in constant prices 2004 for the years 2005 and 2006 (European Parliament and Council 2003). For the period from 2007-2013, the Commission proposed the budget for all market related expenditure and direct payments on agriculture as shown in the table below, but the multi-annual financial framework is still not decided upon as recent negotiations failed, with the share of the total budget spent on agriculture being one major issue of dispute.

Table 1 Commission´s proposal for the agricultural budget (Mio €)

	2006	2007	2008	2009	2010	2011	2012	2013
At 2004 prices	43.735	43.500	43.673	43.354	43.034	42.714	42.506	42.293
Current prices[4]	45.502	46.163	47.273	47.866	48.463	49.065	49.803	50.544

Source: Own calculations based on European Commission 2005b.

2.2 WTO Commitments on Export Subsidies

Since the URAA, export subsidies are subject to both budgetary and quantitative limits stipulated in the WTO notifications. The annual commitment levels in terms of outlays and quantities as well as the use made by the EU of them in the marketing year 2002/2003 are represented in Table 2. For wheat and wheat flower, rice, skim milk powder, cheese, poultry, wine, fruits and vegetables and alcohol either the budget or the volume utilized exceed 80 percent of the commitment. Similar results can be found for past years as well. Consequently, part of our analysis focus on the question how the recently proposed elimination of these subsidies would impact on EU markets and agricultural income, and to what extent the resulting budget savings are offset by possible increases in market interventions.

above that level is available with the provision that further purchases might be approved within a tender procedure.

[3] Subheading 1a is the agricultural part of the budget, the so-called first pillar.

[4] In its proposal, the Commission uses a deflator of 2% per year in order to calculate the FEOGA expenditure in the first pillar in prices of 2004 (European Commission 2004b).

Table 2 EU commitments and utilization of export subsidies 2002/2003

	Subsidised exports		Commitment levels		Utilization	
	Outlays (Mio EUR)	Quantity ('000 t)	Outlays (Mio EUR)	Quantity ('000 t)	Budget utilized%	Volume utilized %
Wheat and wheat flour	141.20	12,055.3	1,289.7	14,438.0	10.9	83.5
Coarse grains	167.00	6,259.3	1,046.9	10,843.2	16.0	57.7
Rice	24.90	127.7	36.8	133.4	67.7	95.7
Rapeseed	0.00	0.0	27.7	103.8	0.0	0.0
Olive oil	0.00	0.0	54.3	115.0	0.0	0.0
Sugar	292.50	600.5	499.1	1,273.5	58.6	47.2
Butter and butter oil	545.10	292.0	947.8	399.3	57.5	73.1
Skim milk powder	163.00	220.2	275.8	272.5	59.1	80.8
Cheese	267.70	317.0	341.7	321.3	78.3	98.7
Other milk products	596.20	833.4	697.7	958.1	85.5	87.0
Beef meat	285.10	358.6	1,253.6	821.7	22.7	43.6
Pork	14.60	61.0	191.3	443.5	7.6	13.8
Poultry meat	90.50	247.4	90.7	286.0	99.8	86.5
Eggs	5.10	59.5	43.7	98.8	11.7	60.2
Wine	17.90	2,096.0	39.2	2,304.7	45.7	90.9
Fruit and vegetables, fresh	15.30	711.0	52.8	753.4	29.0	94.4
Fruit and vegetables, processed	3.10	66.9	8.3	143.3	37.3	46.7
Raw tobacco	0.00	0.0	40.2	110.8	0.0	0.0
Alcohol	90.40	850.0	96.1	1,147.4	94.1	74.1
Incorporated products	413.60	-	415.0	-	99.7	

Source: Own calculations based on (G/AG/N/EEC/52)

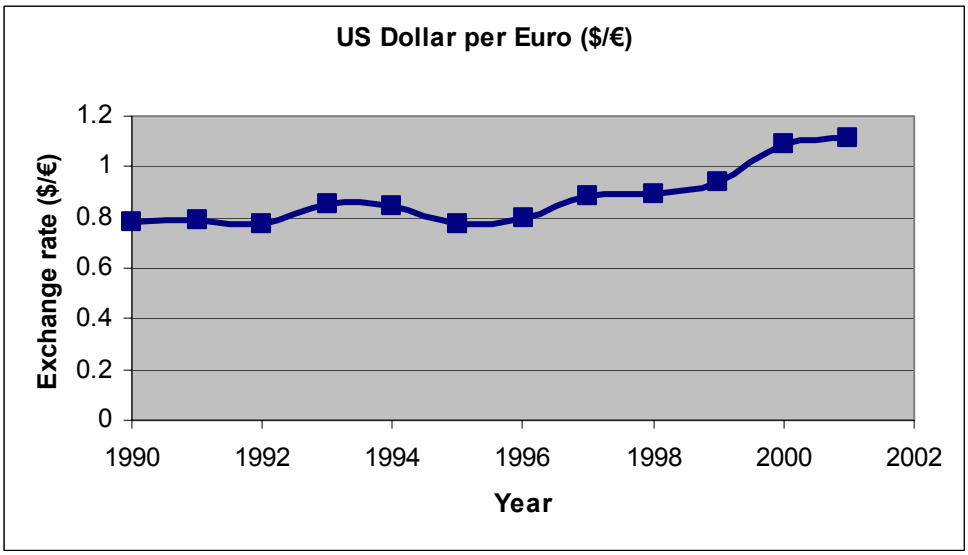
2.3 Exchange Rate Development and Implications for EU Market Intervention

The effect of different exchange rate scenarios on agricultural markets is relatively straightforward. A stronger currency decreases the competitiveness of the country's exports in foreign markets while rendering at the same time imports from trading partners more competitive in the domestic market. Under the heterogeneous good assumption applied in our analysis, the effect on the domestic market depends to a large extent on the substitutability of the EU's exports and imports by products from other origins. A stronger Euro may trigger a drop of EU market price to administrative price levels which either lead rather automatically to intervention purchases (cereals excluding rye, beef, rice, butter, skimmed milk powder, sugar) and/or may induce exports with subsidies. In some markets, subsidies for private storage may kick in as well. However, for butter and rice, the CMOs restrict the maximum amount bought into intervention in any one year, and as discussed above, subsidized exports are already restricted by WTO commitments, and may be wiped out completely in the future. In other words: a stronger Euro provokes higher budget outlays and depending on the respective monetary ceilings, market prices may even drop below administrative prices.

The graph below depicts the development of the Euro over time. After high world market prices for cereals in the mid nineties, world market prices dropped significantly in the marketing year 1998/1999 coinciding with a stronger Euro and consequently, price pressure increased considerably (European

Commission 2003). Responding to this development, the EU adjusted the import regime for wheat and barley in 2001/2002. Under the old regime resulting from the Uruguay round, the EU used MFN tariffs designed as "flexible levies" based on an artificial CIF price Rotterdam deduced from US market notations for cereals. The difference between 155% of the administrative price for cereals and this artificial CIF price was charged as the MFN tariff as long as it was lower than the bound rate. However, the strong Euro lead to sizeable imports into EU cereal markets at these MFN rates. The new regime fixes the MFN tariff at around 90€ (the bound rate from the Uruguay round). At the same time import quotas were successfully negotiated with EU's trading partners to allow market access at in-quota tariffs around 15€.

Figure 1 Development of $/€ exchange rate



Source: Exchange rate as used in CAPRI.

As argued above, the exchange rate will impact on *intervention purchases and stock piling,* a view underlined by a current outlook report of the EU[5]. Two assumed $/€ exchange rates of 1.0 and 1.4 resulted in a total cereals stock difference of 32 Mio tons (projection for the year 2010). The question whether these assumptions are realistic developments under the current CAP legislation and different trade regimes is part of the analysis of this paper.

[5] Publication related to the presentation of the outlook report in December 2004. Available at: http://europa.eu.int/comm/agriculture/publi/caprep/prospects2004b/pres.ppt#261,11, "Prospects remain conditional on exchange rate environment".

3 The CAPRI Modelling System

For the purposes of this study, the CAPRI (Common Agricultural Policy Regionalised Impact) modelling system is chosen as the instrument for quantitative analysis.[6] CAPRI is an agricultural sector model linking non-linear mathematical programming models for about 250 regions covering the whole of EU25, Norway, Bulgaria and Romania with a global market model for agricultural products. In the regional models, agricultural supply of 39 crop and 19 animal activities covering all agricultural activities according to the definition of national accounts, as well as feed and further input demand are modelled by maximising market revenues plus premiums minus a non-linear cost function under a limited number of constraints: land, policy (e.g. quotas and set-aside obligations) and feeding restrictions. The supply module allows for an explicit representation of the different (semi-decoupled) payment schemes of the CAP, differentiated across production activities and regions.

Price interactions between the EU25 countries and 17 other countries or country blocks[7] are taken into account through the market module, a comparative static, spatial multi-commodity model for about 40 primary and secondary agricultural products. The module features flexible and regular systems of supply, human consumption, feed, and processing functions, thus allowing for the calculation of welfare changes for producers, consumers, the processing industry, and the public sector. The parameters of the behavioural functions are borrowed from literature, but calibrated in a way that homogeneity, curvature, symmetry, and adding-up restrictions are fulfilled globally.

Policy instruments for regional aggregates in market model include bilateral tariffs (specific and ad valorem) and price wedges based on OECD's producer and consumer support estimates. For the EU25, a more explicit representation of intervention sales and subsidised exports under WTO commitments is realised. The model captures several dozen TRQs worldwide, covering all important ones for EU's agricultural markets. TRQs in the model are either allocated to specific trading partners or open to any imports. Tariffs and imports under TRQs in the model are endogenous, so that regime switches from underfilled, to binding and to over-quota imports and vice-versa along with the resulting changes in tariffs are modelled endogenously. Equally, the model captures the remaining flexible levies in cereal markets and safeguards for sugar and rice for the EU.

---

[6] The CAPRI modelling system is maintained, applied and further developed by a network of European researchers co-ordinated by the Institute of Agricultural Policy, Market Research and Economic Sociology at the University Bonn, and mainly funded by EU research projects or directly by EU Commission services. A reference version of the model along with its documentation, underlying data base and exploitation tools is distributed to the network during yearly training sessions. Further information can be found at: http://www.agp.uni-bonn.de/agpo/rsrch/capri/capri_e.htm.

[7] Trade blocks in the model are: EU15, EU10, Bulgaria & Romania, Rest of Europe, USA, Canada, Mexico, MERCOSUR countries, Rest of South America, India, China, Japan, Rest of Asia, Australia & New Zealand, Mediterranean countries, Least Developed Countries, ACP countries and Rest of the World. The EU15, EU10, MERCOSUR and Mediterranean countries feature behavioural equations at single country level.

Substitution between imports and domestic production is modelled based on the Armington assumption, using an approach where substitution between import flows is nested into the substitution of domestic production and imports using "Constant Elasticity of Substitution" functions (CES). As seen from the table below, substitution elasticities are in many cases set to rather high values. It is assumed that substitution between imports from different origins is generally stronger than substitution between imports and domestically produced goods. This is rationalized on the basis that consumers are more indifferent toward the different sources of imported goods compared to the choice between imported or domestic products. Contrary to most CGE models, no "Constant Elasticity of Transformation" function is introduced to distinguish between products sold domestically and products sold in international markets. Two well-known problems of the Armington approach also relevant for this application are the lack of empirically based substitution elasticities and the missing possibility to calibrate to zero flows[8].

Table 3 Substitution elasticities for the CES-nesting in the Armington approach

Product	Substitution elasticity between import flows	Substitution elasticity between imports and domestic sales
Generally	10	5
Meats, Butter	6	4 (beef for the EU15: 2)
Cheese, Fresh milk products	4	2
Japan, all products	5	2.5
Fruits and vegetables for Mediterranean countries, rice for the EU	0.8	0.5

Source: CAPRI model

In order to understand the implications for EU-budgets discussed in the result section, it is helpful to understand how market interventions and export subsidies are modelled in CAPRI. Intervention purchases by the EU Commission are determined in the model as the probability of the market price to undercut the administrative price multiplied with a maximum quantity which may be bought into intervention in a year. In order to determine the probabilities, EU market prices are assumed to be normally distributed, where the variance is set equal to the error variance of a linear trend line around a time series of world market prices. The simulated intervention purchases are added to the stock level of the base period. Intervention releases from stocks are defined as the product of three terms: (1) stock levels, (2) the probability that EU market prices undercut average unit value imports, and

[8] In the current model version, zero trade flows observed in the base year remain zero during simulation as well. In a paper by Witzke and Adenaeuer (2005), a variant of the CAPRI market model is discussed with a modified Armington specification comprising commitments in the utility function and thus allowing the calibration of the model to zero flows and positive quantities for the same flows during simulation.

(3) the probability that EU market prices exceed the administrative price. Quantities exported with subsidies follow a sigmoid function whose parameters are determined such that the function recovers the quantities reported for the base period at base period prices and results in exports of 5% of the WTO commitments when market price reach 125% of the intervention price. Intervention stocks hence increase if EU market prices decrease, and at the same time, subsidised exports are expanded. Intervention stocks decrease if EU market prices or unit value exports of the EU increase.

The *costs of market intervention* are calculate as follows: (1) average stock levels multiplied with so-called "technical costs" as reported by the EU Commission; plus (2) financial costs determined as 4% of the average stock value, the latter calculated as stock size multiplied with the mean of the market prices in the base and final period; and (3) depreciation: final stock values multiplied with the difference between EU market prices and unit value exports, and finally (4) the costs of the quantities bought into intervention multiplied with the EU administrative prices minus quantities released multiplied with the unit export value of the EU. *Costs of export subsidies* are the per unit export subsidy multiplied with the quantity exported with subsidies.

The supply and the market module are linked by an iterative procedure converging to market clearing prices and quantities. Technically, in each iteration, all regional supply models are solved with fixed prices coming from the market module. Resulting quantities are used afterwards to shift the supply and feed functions for EU27 and Norway in the market module so that they provide a first order approximation to the quantity responses of the regional supply models in the current iteration. Equally, in between iterations, specific modules define EU-wide market clearing prices for young animals and adjust CAP premiums to comply with ceilings in values or quantities.

4 Scenario Description

4.1 Reference Scenario

In this exercise, the CAP reform of 2003, as it would be implemented in 2012 is part of the *reference scenario*. It thus includes the currently most plausible implementation of decoupling and payment scheme options (single farm payments, regional uniform payments or hybrid forms) for the different EU Member States, modulation of direct payments, capping of export subsidies and EU preferential trade agreements with least developed countries (EBA initiative: duty and quota free access[9]) as well as African, Caribbean and Pacific countries under the Cotonou agreements. It comprises specific and ad-valorem tariffs as currently applied by the different WTO members.

[9] Sugar was excluded from quota and duty free access as it is not yet clear how the EU will organize its CMO for sugar in the coming years.

The general idea of the latest CAP reform was to decouple most of the existing product specific support by converting it into a premium paid per hectare of land, with uniform rates either at farm or at regional level. The regional flat rate option was originally introduced to ease the implementation in the new Member States of the EU, but it is now open to all Member States. However, as some of the Member States opposed the idea of full decoupling, the final package allows to keep certain percentages of the old coupled support in some production activities. There were some other changes in the CAP relevant to agricultural product markets prices compared to the base year levels (average over the years 2001-2003): cuts of administrative price (cereals: -2.5%, butter: -25%, rice: -50%) and the -15% reduction for skim milk powder already foreseen in Agenda 2000. Furthermore, rye intervention was abolished, intervention purchases for butter and rice restricted to 30000 t and 75000 t per year, respectively, and the milk quota increased by 2.3%. The latter was again already part of the Agenda 2000 package. All these changes are considered in the reference scenario for the year 2012. An inflation rate of 1.9% p.a. is assumed for all EU Member States, which leads to a reduction of agricultural support in real terms as ceilings in values on premium schemes are defined based on historical levels and remain unchanged in nominal terms. The same holds for administrative prices and export subsidy commitments.

The Tariff Landscape

The tariffs underlying the reference run are generated from the AMAD data base and thus based on almost 1 Mio different tariff lines. There are almost unlimited possibilities how to aggregate over these tariffs lines to arrive at the product (HS2 to HS3) and regional aggregation level of CAPRI, with one major issue being the fact that prohibitive tariffs may drop out of a weighting scheme that is based on realised imports. To circumvent this problem, we used an aggregation where arithmetic averages over all tariff lines related to products in CAPRI enter with a 50% weight and import weighted averages entering with the remaining 50%. Averages were calculated separately for applied and bound rates, as well as for ad valorem and specific rates. For ad valorem rates, import values were used as weights, opposed to import quantities in case of specific rates. Import weights could only be applied after tariff lines where aggregated up to HS6 as no import notifications below HS6 are available in AMAD. Bound rates and applied rates are available as yearly series, in case of applied rates up to the year 2004. Applied rates after the year 2004 were set to the minimum of the bound rate and the 2004 rate.

Projection to the Year 2012

The modelling system comprises a tool for projection purposes which combines trend analysis and projection results from other studies with a larger set of consistency restrictions. For EU25, Norway, Bulgaria and Romania – the regions represented by regional supply models – the restrictions cover land balances, closed market balances, feed restriction of animals, fat and protein balances for dairy processing plus the impact of policy instruments as quotas and set-aside restrictions. Bounds are introduced for specific developments, such as herd size increases for pigs and poultry to capture the

effect of agri-environmental legislation. A Highest Posterior Density Estimator is used to find the most probable deviation from trends or exogenous studies satisfying these restrictions (for further information see Heckelei et al. 2005). After these projection results are available for EU27 plus Norway, a second step defines developments in all other world regions that are in line with the projections generated in the first step. These second step projections include bilateral trade flows as well market and import prices. The restrictions in second step cover all quantity balances and price transmission equations comprised in the market model.

Major developments in EU25 underlying the reference run are in-line with the latest DG-AGRI baseline. For the rest of the world, FAO's @2030 exercise and results from FAPRI were used as a yardstick for the projection in this second step (Bruinsma 2003, FAPRI 2005). As no exogenous projections of trade flows are available to us, a rather simple procedure was applied: the yardsticks against which deviations are penalised consist of the flows from the base year forecasted with growth rates set as a simple average of the growth rates found in the exogenous projection of the exporter's production and the importer's total demand. The only deviation from these simple rules are imports under TRQs where bounds are introduced case by case, mostly reflecting ex-post fill rates. Finally, the parameters in the behavioural equations are calibrated to the results of these projection tools in the simulation year.

4.2 Impact Scenarios

This previously described reference scenario is compared with four different impact scenarios for the year 2012 differentiated by export policy and economic framework conditions.. Given the lack of a newer concrete proposal, the basic impact scenario builds on the WTO Draft Proposal as set out in 2003 by the former chair Harbinson (*Harbinson scenario*). It suggests an average cut in bound tariffs by 60 % with different percentage reductions depending on the tariff level (see Table 4 below) plus a 50 % reduction in export subsidy commitments combined with existing TRQs increased to at least 10% of domestic consumption (WTO 2003). A second scenario (*Harbinson scenario without export subsidies*) keeps tariff reductions and TRQ changes the same, but completely eliminates EU export subsidies according to the framework agreement of August 2004 (WTO 2004a) which states that "all forms of subsidies will be eliminated by a 'credible" date" (WTO 2004b, p. 27). Finally, both policy set-ups are analysed at two different $/€ exchange rates in 2012: at 1.12 $ per € and at 1.36 $ per € ("*strong Euro"*), the highest rate observed since the introduction of the Euro.

With respect to the actual implementation of tariff cuts in the model, note that it is still unclear if tariffs will be cut "line-by-line", or if more flexibility within the different tiers will be allowed. As the speculation on a plausible outcome of the resulting tariff reductions for individual tariff lines under a broader reduction commitment is beyond the scope of the current analysis, we rely on a line by line cut according to the product definitions represented in the model.

The ad valorem equivalents (AVE) to define the tariffs cuts for specific tariffs under the WTO proposal are calculated as a 25%-75% weighted average of region specific and global import prices.[10] However, given the fact that tariffs and import prices in the model already represent an aggregation of the different tariff lines to primary product equivalents, the effect of using different formulas to calculate ad-valorem equivalents can be almost neglected. Reductions were applied to specific and ad-valorem MFN, as well as in- and out-of-quota tariffs in the case of TRQs. Note that tariff reductions and TRQ expansion as described in the two scenarios are applied to all country aggregates represented in the model, not only for the EU.

Table 4 Simulated tariff cuts depending on ad-valorem equivalents

AVE (Ad valorem equivalent)	Reduction in tariff
>= 90 %	- 60 %
<= 15 % < 90%	- 50 %
< 15 %	- 40 %

Source: Own presentation based on WTO (2003).

Furthermore, there are three important points to note regarding the representation of border protection instruments in the scenarios: Firstly, the model uses the lower of applied and bound rates in all scenarios, but reduces bound rates, only. A change in a bound rate may hence not provoke an equal change in the actual applied border protection. Secondly, the model comprises estimates of TRQ quota rents so that reductions of the over -quota and in-quota tariffs provoke changes in trade flows only for such TRQs that are not longer binding. In the case of a binding TRQ, a tariff reduction only implies a change in quota rents, but does not increase market pressure via higher imports. Because of the flexible import levy mechanism for cereals, rice, and sugar beet described earlier, a reduction in the bound rate may again not result in a change in applied rates if the new bound rate remains larger than the applied rate necessary to keep the import price at the desired level.[11]

4.3 Critical Points in the Analysis

Before presenting results, we want to mention some methodological issues related to policy representation and general model structure that impact on simulation results and must be subject to careful consideration. Firstly, tiered tariff reductions under the WTO proposal are applied to average tariffs over several tariff lines which may somewhat underestimate peaks in tariffs lines and thus the reduction effects. The implemented tariff reductions are therefore possibly closer to the outcome of a "banded" tiered approach. We have not taken the possibility of "sensitive products" into account,

[10] Given the prices available in this modeling system, this approach is as close as possible to the final outcome of the AVE decision of the WTO members (for further information see ICTSD 2005).

[11] The mechanism of flexible levies in cereals markets which is modelled by the described safeguard mechanism was however replaced in 2003 by TRQs for wheat and barley.

which could mean that we have overestimated tariff reductions for some products. We work towards a solution where we will be able to calculate tariff reductions in the scenarios on individual tariff lines and to include assumptions on sensitive products, but that will require some time.

Secondly, the empirical basis to project fill-rates and quota rents for TRQs in the reference run is a generally difficult problem, aggravated by the representation of higher level product lines. However, these projections may have a strong impact on simulation results as they implicitly determine the competitiveness of products from other origins compared to the EU. Again, an improvement is part of the research agenda for the next year.

Thirdly, the country aggregation mixes in some cases WTO with non-WTO members, so that the simulated tariff reductions for these aggregates are probably overestimated. In the case of EU, obvious critical cases are cereal import tariffs for Russia and Ukraine.

5 Major results

5.1 Effects on Crop Markets

Land Allocation and Crop Production

Given the substantial price decreases shown in Table 5 below, the changes in the crop allocation and crop production quantities may be at first glance astonishingly low: Compared to the reference run, in the *Harbinson scenario* with standard exchange rate assumptions, cereal areas decrease by -1.2% and vegetable and perennial crops by -1.75%. This decreased land use is offset by more set-aside and fallow land (+3.6%), oilseeds (+1.3%) and a slight increase in fodder areas (+0.3%) combined with extensification, i.e. lower grass land yields and a shift from fodder maize to grass silage on arable land. The shift towards oilseeds (+1.3% or +90000 ha) in the Harbinson scenario can be explained by increased competitiveness compared to other crops since oilseeds were not protected by tariffs in the reference run. The *elimination of export subsidies* does not affect the crop allocation significantly: all changes in land allocation range around +/- 0.5% compared to the crop allocation in the Harbinson scenario. However, the assumption of a *strong Euro* changes the picture. For both scenarios ("Harbinson strong Euro" and "Harbinson strong Euro without export subsidies") this assumption results in an additional increase in voluntary set-aside (+2.8%) and fallow land (+3.5%) compared to the respective scenarios with a weaker Euro. But given the small share of idling land in Europe, the resulting impact on major crops is quite limited: the changes for cereals, fodder areas and fruits and vegetables are below +/-0.5% compared to the situation with a weaker Euro.

Land Values

One of the reasons for the moderate reactions of crop allocation and production in the different scenarios is the fact that prices for all crops are under pressure, resulting in lower land prices. For the

Harbinson scenario, land prices drop by about -15 % or around -30 € in EU average. The *elimination of export subsidies* leads to a further decrease of land values by -5 € (-3%) compared to the standard Harbinson scenario. Both simulations with *stronger exchange rates* decreased the land values additionally in a similar rate (around -13 €) compared to the Harbinson and Harbinson without export subsidies scenarios.

Set-aside and Fallow Land

A second reason for these moderate reactions in crop allocation and production quantities is related to the fact that the decoupled premiums paid for land require that land is kept in good agricultural conditions. Thus, this requirement provides a certain incentive to continue the use of land for agricultural production. Note that set-aside is eligible for the decoupled payments as well, but plant cover must be removed from set-aside land at least once a year. These related costs somewhat decrease the incentive to idle land in the voluntary set-aside scheme, but still, voluntary set-aside is moderately expanded by +9% or about 120000 ha in the *Harbinson scenario* compared to the reference run. This voluntary set-aside is further expanded under the two other scenarios with the *strong Euro* scenarios showing again the more significant impact (+40000 ha) compared to the *Harbinson subsidy elimination scenario* where only 23000 ha are added. The reader is reminded that the major part of set-aside in the EU is under obligatory programs, and since the latest CAP reform, these hectares are fixed at farm level (6.2 Mio ha) and no longer a function of yearly crop allocations.

With regard to land abandonment, i.e. land not in good agricultural condition (fallow land) and not eligible for decoupled support, we observe that the removal of border protection (*Harbinson scenario*) leads to increases by about +5.4% or 350000 ha compared to the reference run. Here again, the *elimination of export subsidies* only insignificantly increases this value, whereas, the both simulations with a *stronger Euro* result in additional land abandonment in the range of +235000 ha (3.4%) compared to the Harbinson and Harbinson without export subsidies scenarios.

Price and Market Developments

Compared to the reference scenario, producer prices in *cereal markets* in the EU drop by about -8% leading to an average price level of 102 € per t under the *Harbinson scenario.* This market pressure results from increased imports by 40 % or about 9.6 Mio t of cereals. The additional imports consist mainly of wheat, barley and maize and mainly substitute imports of other coarse grains (-1.4 Mio t). We observe as before, that the development of the exchange rate has a more significant effect than the elimination of export subsidies: the *subsidy elimination scenario* adds further -2% price decrease, whereas the simulations with a *stronger Euro* provoke a price drop around -3% compared to the Harbinson and Harbinson without export subsidy scenarios.

However, these market reactions to a 60% decrease in average MFN tariffs are rather modest and result from the EU border protection system. As explained above, the EU uses applied tariff rates

linked to a safeguard mechanism for cereals. These applied rates cannot exceed the MFN bound rates which are around a 100 € per ton with slight variations for the different cereals. In the reference run, the maximum flexible levy is found in maize markets with 60 € per ton. For all other cereals, applied tariff rates in the reference run are in the range of 30 to 50 € per ton. The Harbinson scenario reduces MFN bound rates to about 40 € in average for cereals. Hence, with the exception of maize, no actual tariff reduction takes place and no new market access is created. Consequently, there is little import pressure in the cereal markets from changes in tariffs alone. However, under the *Harbinson scenario*, expanding the TRQ increases imports into wheat (+5 Mio t) and barley markets (+3.6 Mio t) compared to the reference run and are the main drivers for lower prices. The assumption of a *stronger Euro* leads to additional 500000 t of wheat compared to the Harbinson proposal.

Prices in the *oilseed* markets follow the price developments in the cereals markets with a similar drop for the oilseeds aggregate of -3.1% in the *Harbinson scenario* compared to the reference run. However, the assumptions of *strong Euro* leads to more pronounced price decreases with an average reduction of -7.7%, but much stronger developments in sunflower and soya markets compared to the Harbinson scenario. Since oilseeds are not subject to *export subsidies*, the reaction to this *elimination* of the latter are very low with price decreases ranging below -1% compared to the Harbinson scenario. Nevertheless, in particular in the two *strong Euro* scenarios, these price developments lead to significant import expansions and stimulate the use of oilseeds in feeding rations to some extent. This increased feed use dampens the reaction on oilseed production: we observe a decrease by around -1.15% on average.

In the *Harbinson* scenario, markets fo*r permanent crops and vegetables* are under considerable price pressure compared to the reference run (-13.4% on average, with large effects on e.g. tomatoes -24%). This price pressure is further increased in both *strong Euro* scenarios (-5% compared to the Harbinson scenario), whereas the *elimination of export subsidies* is not relevant for this market. However, production is only affected by -4.4% in the *Harbinson run*, with slightly larger changes in the range of -8% for tomatoes and other vegetables. Additional effects on production from the other scenarios are small and lie in the range of +/-1%. This moderate supply response at the aggregate level for most of the fruit and vegetables products is due to rather low supply elasticities in the medium term. Stronger reactions can be expected in the long run when no existing plantations are renewed, but these developments are outside the scope of this modelling framework.

Trade Flows

The additional *cereals imports* in the *Harbinson scenario* come to the largest extent from Rest of Europe (+6 Mio t) and Mercosur countries (+5 Mio t). Reductions of about -1 Mio t are shown from

Rest of the World.[12] EU exports increase by +9 Mio t, mainly with destination to other European ("Rest of Europe") and Mediterranean countries. Very similar findings hold for the two *strong Euro scenarios* where also Mercosur and Rest of the World countries are the main beneficiaries of these developments and consequently increase their import quantities by additional +2 Mio t and 800000 t, respectively. *Elimination of export subsidies* leads to reduced export quantities of around -2 Mio t, but imports decrease as well (e.g. for cereals by -0.8 Mio t) since EU products gain competitiveness on domestic markets under lower EU market prices. The *oilseeds imports* into the EU are dominated by Mercosur countries, USA, Rest of Europe and Rest of the World countries. In the *Harbinson scenario*, mainly Rest of Europe (+935000 tons) can benefit from the better import opportunities substituting the import quantities formerly provided by USA (-244000 tons) and Mercosur (-403000 tons). However, under the assumption of a *strong Euro* this trend is reversed and USA and Mercosur can offset their losses simulated under the Harbinson scenario and import additional quantities into the EU.

[12] Note again, that imports from Rest of Europe and Rest of the World may be overestimated, as the aggregates comprise Ukraine and Russia which are currently not members of WTO. Hence, they would not automatically profit from the TRQ expansion and reduced border protection.

Table 5 Prices and their changes compared to the reference run for 2012

	MTR standard	WTO Harbinson	WTO Harbinson, Euro at 1.37 US$	WTO Harbinson, no export subsidies	WTO Harbinson, Euro at 1.37 US$, no export subsidies
	Euro / t	Euro / t	Euro / t	Euro / t	Euro / t
Cereals	112.03	102.47	99.44	100.12	96.93
		-8.5%	-11.2%	-10.6%	-13.5%
Oilseeds	216.77	210.15	200.09	209.04	198.94
		-3.1%	-7.7%	-3.6%	-8.2%
Vegetables and Permanent crops	600.9	520.5	491.92	520.55	491.95
		-13.4%	-18.1%	-13.4%	-18.1%
Beef	2205.53	1877.28	1807.43	1818.01	1713.6
		-14.9%	-18.1%	-17.6%	-22.3%
Pork meat	1396.9	1373.98	1343.51	1365.59	1334.01
		-1.6%	-3.8%	-2.2%	-4.5%
Sheep and goat meat	5574.64	5127.95	4728.99	5114.03	4710.09
		-8.0%	-15.2%	-8.3%	-15.5%
Poultry meat	1218.38	1173.71	1133.62	1166.81	1125.7
		-3.7%	-7.0%	-4.2%	-7.6%
Olive oil	3465.14	2997.94	2872.2	2993.83	2866.94
		-13.5%	-17.1%	-13.6%	-17.3%
Cow and buffalo milk	292.79	253.23	242.25	246.73	234.19
		-13.5%	-17.3%	-15.7%	-20.0%
Dairy products	1354.12	1287.9	1268.55	1267.29	1242.87
		-4.9%	-6.3%	-6.4%	-8.2%
Butter	3190.96	2823.55	2758.39	2705.15	2609.25
		-11.5%	-13.6%	-15.2%	-18.2%
Skimmed milk powder	2450.07	2229.32	2165.91	2173.14	2096
		-9.0%	-11.6%	-11.3%	-14.5%
Cheese	4600.63	4331.76	4259.06	4276.17	4190.45
		-5.8%	-7.4%	-7.1%	-8.9%

Source: CAPRI Modelling System

Table 6 Product balances and changes compared to the reference run for 2012

	MTR standard		WTO Harbinson		WTO Harbinson, Euro at 1.37 US$		WTO Harbinson, no export subsidies		WTO Harbinson, Euro at 1.37 US$, no export subsidies	
	Supply*	Demand**	Supply*	Demand**	Supply*	Demand**	Supply*	Demand**	Supply*	Demand**
	1000 t		1000 t		1000 t		1000 t		1000 t	
Cereals	270427	252702	265775	251340	264080	248712	264720	251561	262960	248786
%			-1.7	-0.5	-2.3	-1.6	-2.1	-0.5	-2.8	-1.5
Oilseeds	16865	39034	17141	39938	16894	41644	17222	39934	16979	41609
%			1.6	2.3	0.2	6.7	2.1	2.3	0.7	6.6
Vegetables and Permanent crops	128789	155698	123069	167222	121708	173497	123091	167117	121731	173371
%			-4.4	7.4	-5.5	11.4	-4.4	7.3	-5.5	11.4
Beef	7657	8204	7449	8477	7428	8495	7418	8509	7374	8545
%			-2.7	3.3	-3.0	3.6	-3.1	3.7	-3.7	4.2
Pork meat	21699	20908	21762	20615	21547	20531	21722	20602	21496	20506
%			0.3	-1.4	-0.7	-1.8	0.1	-1.5	-0.9	-1.9
Sheep and goat meat	1051	1343	1028	1384	1008	1450	1027	1379	1007	1442
%			-2.2	3.0	-4.1	8.0	-2.3	2.7	-4.2	7.4
Poultry meat	11187	11087	11034	10980	10783	11153	11024	10971	10767	11128
%			-1.4	-1.0	-3.6	0.6	-1.5	-1.0	-3.7	0.4
Olive oil	2624	2340	2604	2378	2599	2389	2604	2377	2600	2388
%			-0.8	1.6	-0.9	2.1	-0.7	1.6	-0.9	2.1
Dairy products	69184	69545	67712	69327	67395	69311	67763	69366	67461	69354
%			-2.1	-0.3	-2.6	-0.3	-2.1	-0.3	-2.5	-0.3
Butter	1928	1962	1912	2058	1896	2096	1902	2048	1883	2079
%			-0.8	4.9	-1.7	6.8	-1.4	4.4	-2.4	6.0
Skimmed milk powder	1810	2995	1767	3056	1716	3107	1746	3055	1690	3103
%			-2.3	2.0	-5.2	3.8	-3.5	2.0	-6.6	3.6
Cheese	8638	8280	8715	8293	8732	8298	8706	8303	8718	8310
%			0.9	0.2	1.1	0.2	0.8	0.3	0.9	0.4

*: Net production, i.e. harvested production exluding seeds and losses on farm;
**Final demand, i.e. human cosumtion, feed use and demand of the processing industry

Source: CAPRI Modelling System

5.2 Effects on Meat and Dairy Markets

Meat Markets: Price, Market and Production Developments

The impact on *beef markets* is somewhat stronger compared to the crop markets. Comparing the *Harbinson scenario* with the reference run, beef prices drop by about -15% as the expanded TRQs are completely filled and these increased imports put pressure on EU prices. However, calve (-13%) and feed costs (-1%) fall as well and thus dampen the effect on supply reactions. Revenues from beef fattening activities decrease in average by -15%. The combined effect of these changes is a reduction

of -3.5% in the beef fattening herds and a reduction of beef meat production of nearly -3% or -0.2 Mio t.

Lower calve prices are due to inelastic demand from dairy and suckler cows, as the *dairy cow* herd remains rather stable (varying between -0.2 and -0.5%). Lower milk prices (-13.5%) mainly erode milk quota rents (in average by -40%) without reducing these rents completely to zero for the vast majority of European regions. Income from dairy production is forecasted to drop by around -24%, mainly due to a decrease in the revenues from milk production. The *suckler cow* activity suffers especially from reduced beef and calves prices. However these effects are offset by the fact that even under the CAP reform 2003 around one third of the revenues in suckler cow production result in most Member States still from premiums that are kept fully coupled to production. Hence, suckler cow herd drops only by -3.8%.

Elimination of export subsidies leads to additional price reduction of -2.7% for beef meat, the resulting changes in production and demand quantities, however, do not amount to more then -0.4% compared to the Harbinson proposal. A *stronger Euro* in both scenarios leads to price reductions of about -3.2% and -4.7% for beef compared to the Harbinson and Harbinson without export subsidies scenarios, respectively. The resulting changes in the cattle herds responding to these additional price decreases are small (below-0.5%) due to the stabilizing effect of the milk quota system. This is also reflected by the small additional reductions in beef supply.

The *sheep and goat* herd drops by -2% following a price cut of -8% comparing the *Harbinson scenario* with the reference run. The price cut largely follows from over quota imports occurring at the reduced MFN rates. However, the relative low supply response is due to the still significant share of coupled support. *Elimination of export subsidies* has no sizeable impacts, as no subsidies were paid in the different scenarios. Contrary to that, the assumption of a *stronger Euro* result in price drops by another -7% compared to the Harbinson and Harbinson without export subsidies scenarios, so that demand is increasing in the range of an additional +5%. Since supply is reduced by another -2%, the effect on net trade is even stronger with imports increasing by circa 22% (80000 tons) for sheep and goat meat.

Decreases in *pork and poultry* meat prices are moderate and in the range of -1.6% and 3.7 as underfilled TRQs are projected for the reference run as well as for the *Harbinson scenario.* Import penetration on pork and poultry markets is generally low, even though the Harbinson scenario forecasts an increase in imports by around 87% (40000 t) for pork meat. Here, the effect of an *elimination of export subsidies* is negligible, whereas a *stronger Euro* scenario result in slightly stronger price reduction (-3%) with related moderate changes in marketable production (-1%) and increased imports (+69000 t pork meat, +155000 t poultry meat) compared to the Harbinson and Harbinson without export subsidies scenarios. In the *Harbinson scenario*, herd size of pig (+0.3%) and poultry (+1.3%) even expand slightly since feed costs drop by about -5%. As the e*limination of export*

subsidies almost not affect prices, herd sizes remain unchanged. *A stronger Euro* has a slightly stronger impact with pigs and poultry activity level being decreased by around -1% and -2%, respectively.

Dairy markets: Price and Market Developments

Effects in dairy markets are more pronounced in the *Harbinson scenario* compared to the reference run. This is due to two effects: we observe very high price differential between low cost producers in New Zealand and the EU market price, as well as a rather strong reduction in the high MFN tariffs. Imports increase by +50% (cream, whole milk powder) to +400% (concentrated milk), with skimmed milk powder and butter imports showing a +140% import increase and cheese a somewhat lower development with +75%. However, given that import shares in all markets are rather low, these percentage values correspond with still low rates of market penetration of foreign products on domestic EU markets. Associated with these import developments are price reduction of -6% to -12%, with the larger price changes being in low value products as butter and skimmed milk powder. Production decreases only moderately (skimmed milk powder, cream, concentrated milk) or remains stable (cheese, butter, whole milk powder), since demand is slightly stimulated by the lower prices. Furthermore, the EU can benefit from better export opportunities given that we face a multilateral tariff reduction (+26% average export increase for all dairy products compared to reference run). The *elimination of export subsidies* affects mostly butter (-0.6%) and skimmed milk powder production (-1.2%) and prices (-3.7%, -2.3% respectively), whereas the production and prices of the other products remain almost unchanged in this scenario. For both *strong Euro scenarios* we observe further import surges (+14% in average) compared to the Harbinson scenario. Nevertheless, prices reduce an additional -1.4% to -3.3% for dairy products with butter and skimmed milk powder showing somewhat stronger reductions of around.

Trade Flows

As already indicated above, the discussed differences in price and quantity reactions of the distinct products in the EU depend to a larger extent on the respective import regime. There are almost no changes in *beef* imports between the different scenarios, as the expanded TRQs are always binding. Nevertheless, we observe considerable gains in quota rents in the range of 200 Bio € resulting from tripling the imports under preferential tariff agreements. In both, *pork and poultry markets*, TRQs are underfilled in all scenarios with imports at still rather high preferential rates. In opposite to the beef market with its binding TRQs, the imports of pork and poultry meat react hence as if it is a market with a "tariff-only" regime, and imports double under the reduced preferential tariff rate in the Harbinson scenario and further increase again by factor two in the stronger Euro scenarios. The impact of export subsidy elimination in pork and poultry meat imports is not significant. TRQs in *sheep and goat meat* markets are not expanded as they cover already in the base year with 300000 t more then 10% of the EU market. The reduction in the rather high MFN tariffs allows additional imports from

Australia and New Zealand at MFN rates in all scenarios, so that consequently, imports react rather strongly to changes in the exchange rate. A similar picture is found in the markets for *butter and skimmed milk powder*, where especially New Zealand, benefit from the reduction in the MFN tariffs, so that the binding TRQs from the reference is now overfilled in all scenarios. TRQs for high value dairy products as cheese and fresh milk products show very low fill rates in the reference run, and remain unfilled in the countervailing scenarios.

5.3 Welfare Analysis, Budgetary Impacts, and the Role of Administrative prices

Welfare

Starting again with the *Harbinson proposal*, we note (see Table 7) a strong reduction in agricultural incomes (-13.5 % or -25.1 Bio €) in the EU, whereas consumers (+30 Bio €) and the processing industry (+2.1 Bio €) benefit from lower prices. These impacts leave the EU with a welfare gain of about 7 Bio €. The additional effect on agricultural income of a complete *elimination of export subsidy* amounts to not more then -1% compared to the Harbinson proposal (-2 Bio €). Note, that this is an almost insignificant reduction given the level of agricultural income for EU25 of around 161 Bio € under the *Harbinson proposal*. However, agricultural income losses from export subsidy elimination exceed the decrease in the CAP budget. An explanation for this is the fact that substitution between imports from different origins is assumed to be quite price elastic, so that the removal of export subsidies leads to a strong decline in import demand of EU commodities on world markets. These reduced EU exports pressure on the saturated EU markets with low demand reactions where they provoke relatively strong price decreases. However, this contributes to EU consumer gains in the range of +2 Bio € from the removal of export subsidies.

Under the *Harbinson strong Euro scenario*, welfare gains for EU increase to +14.6 Bio €, meaning even higher losses in agricultural income (-33 Bio €). Almost the same effects in direction and size can be found when the *strong Euro* exercise is repeated for the policy set-up where *export subsidies are removed*. The absolute changes in welfare are almost identical (+7.7 Bio € in total, made up of +13 Bio € for consumers and -9 Bio € for agricultural producers) to the effects of a stronger Euro under the Harbinson proposal.

Table 7 Welfare analysis of the different scenarios (changes to reference run in mio. €)

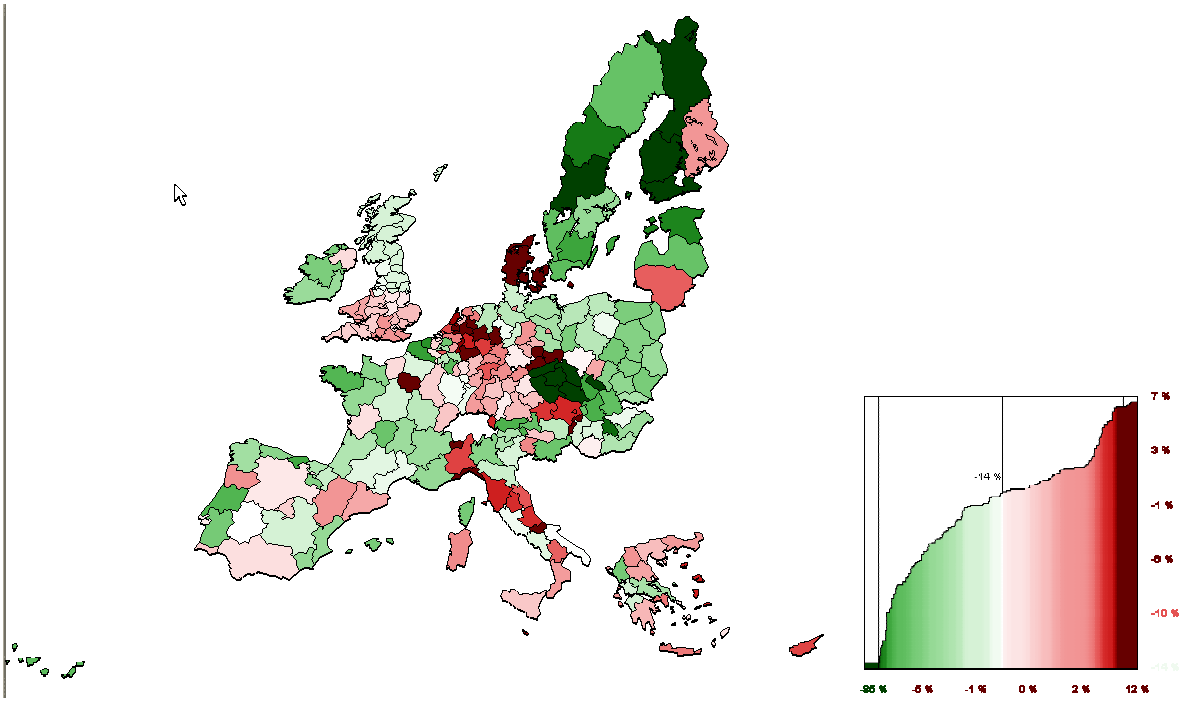
	Harbinson Proposal, €	Harbinson Proposal, 1.37 US$/€	Harbinson Proposal, no ExpSub	Harbinson Proposal, 1.37 US$/€, no ExpSub
Money metric	**+30004**	**+43235**	**+32028**	**+45672**
Agricultural Income	**-24694** *-13.27%*	**-33748** *-18.14%*	**-26635** *-14.31%*	**-36168** *-19.44%*
Profit of dairies	**-426.98**	**-622.84**	**-492.37**	**-727.71**
Profit of processing	**+2141**	**+3257**	**+2156**	**+3295**
Tariff revenues	**+174**	**+3327**	**+24**	**+3090**
FEOGA budget outlays first pillar	**+325.85** *0.73%*	**+825.14** *1.86%*	**-371.64** *-0.84%*	**+70.14** *0.16%*
Total	**+6872**	**+14623**	**+7452**	**+15091**

Source: CAPRI Modelling System

Agricultural Income

The following map shows changes in agricultural income under the *Harbinson proposal*, where regions with a reduction equal to the EU average (-14%) are shown in white. Loss in agricultural income can be found in all regions, however at different level depending on production structure and market prices developments. Income drops of more than EU average are shown in green. They are strong in marginal areas where the weight of cattle activities in income generation is high. This is the case in Ireland, Sweden, Finland, parts of France, and the new EU members. Lower income losses compared to the EU average are shown in red and can be found in regions with a focus on pig and poultry production (the Netherlands, parts of Germany, Denmark, Lombardia), as well as in regions with extensive cereals production (parts of Spain, Southern Italy) where unaffected premium payments represent a large share of income.

Figure 2 Changes in farm income per ha: Harbinson proposal against reference (in %) for the year 2012



Source: CAPRI Modelling System

Budget effects

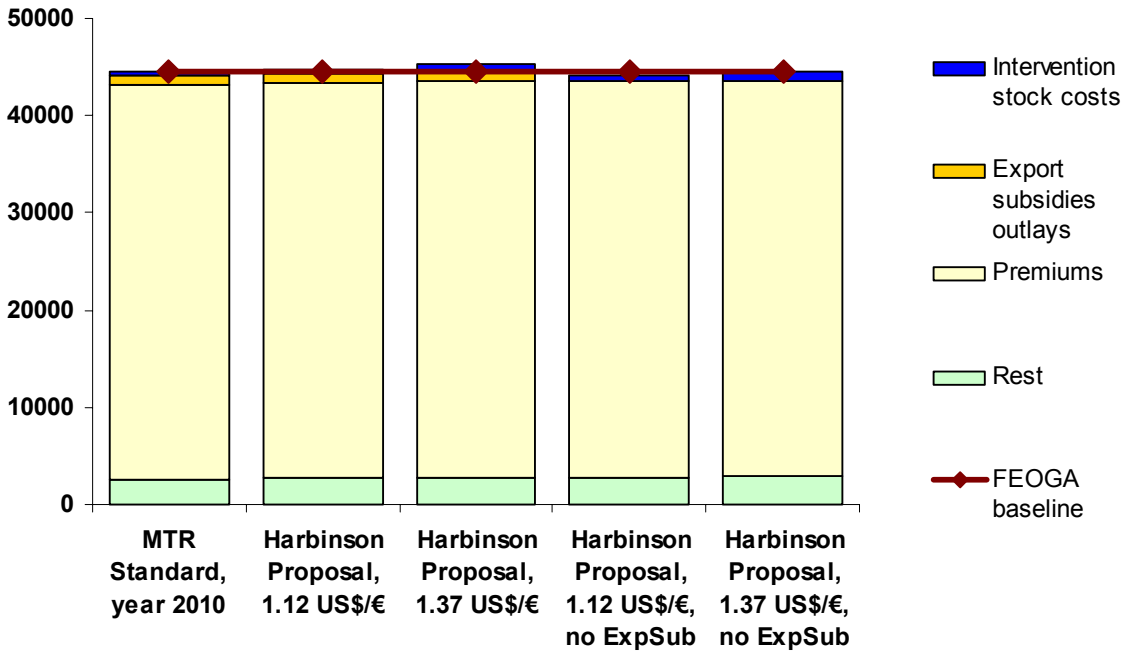
According to the model results the CAP budget for the year 2012 will not be exhausted under the different scenarios (see Figure 3). This is explained by the fact, that already 40.7 Bio € of the total 45 Bio € CAP budget under the first pillar are allocated to the decoupled premium schemes and thus unaffected. Further on, about 2.51 Bio € are allocated to subsidies paid to consumers and the processing industry, and subject only to very little change as there are only limited reactions in the related demand quantities.

The smallest effects on the budget are found under the *Harbinson proposal* and standard exchange rate assumptions where budget increases by +0.3 Bio €, mainly due to the increased costs of intervention purchases by about 250 Mio €. Furthermore, export subsidy outlays increase for dairy products (+190% or +132 Mio €), countervailed by lower export subsidies for cereals (-19% or -52 Mio €) and sugar (-45% or -190 Mio €). A *stronger Euro* let the expenditures under the first pillar of the CAP increase by +0.8 Bio € compared to the reference run, or by +0.5 Bio € compared to the Harbinson proposal. With the exception of premiums, the costs for almost all kind of policy instruments increase (intervention purchases, export subsidies, subsidies to the processing industry and to promote final demand). In both scenarios, on top of the income loss of -33 Bio € resulting from trade liberalisation with lower market prices, the financial discipline would hence provoke cuts in premiums by -0.8 Bio €

to offset the additional costs.[13] It is questionable if the Council would not rather adjust the CMOs by reducing intervention prices to avoid regular market interventions, and thus allow for a more effective spending of the budget.

As mentioned above, *elimination of export subsidies* reduces the budget by -0.7 Bio €, however with increased costs of market interventions. Compared to the Harbinson strong Euro scenario with only reduced export subsidy commitment, the *stronger Euro* has a smaller impact on the budget (50 Mio €) when export subsidies are completely eliminated as only the costs of market interventions could increase. In some markets where export subsidies had been used as in butter and rice, interventions are upper bounded in the CMO, limiting possible cost increases for market interventions. And finally, in some markets where exports were subsidised, as in pig and poultry meat, no interventions at all are foreseen so that the elimination of export subsidies cannot provoke countervailing costs. This explains why the budget is less sensitive to exchange rate fluctuations compared to a policy with export subsidies; however, the backside of this is that higher fluctuations in agricultural income can be observed.

Figure 3 The CAP budget under the different scenarios



Source: CAPRI Modelling System

[13] In this analysis, the expenditure on the first pillar of the CAP resulting from the reference run is used as a benchmark for the possibility of further premium cuts in the case of budget overshooting and not the figures of the Commission´s proposal.

Administrative Prices

As a final point in this section, market prices are compared to administrative ones to analyse to what extent these act as effective price floors. In *cereal markets*, prices for wheat and maize stay above the administrative prices for the *Harbinson scenario*, whereas prices for coarse grains are at or below the administrative price level. With the exemption of rye, where intervention is abandoned since 2004, there are some interventions in all cereals markets and the main amount found is in the barley market with about 0.7 Mio t. Intervention in the barley market increases further in all other scenarios with the scenario *Harbinson strong Euro without export subsidies* showing the strongest increase (+165000 t) compared to the *Harbinson scenario*. Also in the wheat market we observe increasing intervention, however, in absolute values (around 8000 t) they are not comparable to the barley market. Note that the mechanism in the model is certainly somewhat conservative, and larger intervention purchases are not unrealistic. According to the model results, a change in the CMO for cereals reducing the administrative prices would become necessary to avoid piling up of intervention stocks.

In *dairy markets*, the model shows market prices clearly above administrative ones, and thus little pressure on the budget. This holds for all runs. The *beef price* also stays above the administrative price, but the outlays for subsidised beef exports increase significantly from almost zero to 93 Mio € under the *Harbinson scenario*. These export subsidies are even further increased under the assumption of a *strong Euro* with costs of around 164 Mio €.

6 Résumé: How Sustainable is the CAP?

Is the current CAP fit for a probable outcome of the next WTO round? The answer, based on a liberalisation scenario where a tiered tariff reduction of in average -60% combined with TRQ expansions and elimination of export subsidies is assumed, is a “maybe”.

When evaluated against the proclaimed objectives of the CAP, the results show that the new CAP is indeed quite efficient. Firstly, there is very low land abandonment resulting from considerable market price changes, a result of enforced cross-compliance to keep land in good agricultural condition. Secondly, with the bulk amount of the budget now spent on decoupled support, the transfer efficiency of the new CAP is unquestionable high when evaluated with respect to income generated for agriculture. Changes in premiums due to changes in the market environment are now almost non-existent which renders the CAP with its costs and transfers predictable for farmers and tax payers. However, notwithstanding that tax payers might question the overall level of support to EU agriculture in general.

Nevertheless, depending on future exchange rates, administrative prices in some markets may not be defendable, even with increased market interventions and thus the danger of piling up intervention

stocks prevails. If that would happen, increased market intervention may even hurt farmers as a Euro spent on market interventions certainly has a lower transfer efficiency when compared to a Euro spent on decoupled payments. These results may be read as warning signs, especially as the newly introduced financial discipline could require cuts in premiums to offset the costs of increased market interventions. So we may rather expect further amendments in the CMOs to reduce administrative prices.

Given the still high level of EU's border protection in many agricultural markets, considerable reductions in market prices cannot be avoided when market access is improved. Depending on the exchange rate development, there are losses of agricultural income in the range of -13% to -20% resulting from these price changes, but a larger part of the income losses will show up in lower land rents. That effect could help to soften the impact on farm income as significant part of the land rents flow to non-agricultural land owners. Furthermore, lower land rents could speed up structural change, softening the income loss per labour unit. But clearly, rural areas would loose both income and labour in the agricultural sector compared to the status quo. Given that beef and dairy markets show larger price reductions, the analysis predict larger income losses in marginal areas with grass land production systems.

From a viewpoint of the EU trading partners, the analysis hints at limited effects of reduced MFN tariffs alone, given the different forms of "water under the tariffs" found in TRQs and safeguards. In our analysis, to a larger extent, increased market access stems from TRQ expansion. We feel unable to predict if the WTO members will follow the Commission's interpretation and declare the new CAP decoupled payments as green, but the new CAP is certainly easier to understand and to defend than the "Agenda 2000" package.

We may conclude that the latest CAP reform was indeed a quite successful step to render the CAP compatible with further trade liberalisation: only smaller future adjustments in the CMOs may be necessary. However, further structural change is a key issue to soften the impact on agricultural income from trade liberalisation.

7 References

BRUINSMA, J. (ed.) (2003). World agriculture: towards 2015/2030, An FAO perspective, Earthscan Publications, London.

COUNCIL OF THE EUROPEAN UNION (2003). 2528th Council meeting on Agriculture and Fisheries. Adoption of the reform of the CAP (Luxemburg Agreements), Brussels.

COUNCIL OF THE EUROPEAN UNION (2003). Council Regulation 1782/2003 establishing common rules for direct support schemes under the Common Agricultural Policy and establishing certain support schemes for farmers, Official Journal of the European Communities, L270.

EUROPEAN COMMISSION (2003): Prospects for Agricultural Markets 2003-2010, Powerpoint Presentation. Directorate for Agriculture, Luxembourg: Office for Official Publications of the European Communities.

EUROPEAN COMMISSION (2004a). The Second Wave of CAP Reform. Newsletter Special Edition, May 2004, Directorate General for Agriculture, Brussels.

EUROPEAN COMMISSION (2004b). Commission working document: Proposal for renewal of the interinstitutional agreement on budgetary discipline and improvement of the budgetary improvement. COM(2004) 498 final.

EUROPEAN COMMISSION (2005a). Outcome of the Agriculture and Fisheries Council 24 January 2005. MEMO/05/21, 25.01.2005, Brussels.

EUOPEAN COMMISSION (2005b). Commission Working Document: Technical adjustments to the Commission proposal for the multiannual financial framework 2007-2013.

EUROPEAN PARLIAMENT AND COUNCIL (2003). Decision of the European Parliament and of the Council of 19 May 2003 on the adjustment of the financial perspective for enlargement.

FAPRI (2005). U.S. and World Agricultural Outlook. Iowa State University – University of Missouri-Columbia: Ames (Iowa).

HECKELEI, T., MITTELHAMMER, R., BRITZ, W. (2005). A Bayesian Alternative to Generalized Cross Entropy Solutions for Underestimated Models, Paper presented at the 89th EAAE Seminar "Modelling of agricultural policies: State of the art and new challenges., Parma (Italy).

ICTSD (2005). Agriculture: Key Trade Ministers Strike AVE Deal in Paris, Bridges Weekly Trade News Digest – Vol. 9, no. 16, 11 May 2005, Geneva.

WITZKE, H.P., ADENAEUER, M. (2005). Modelling EU Sugar Market Scenarios: Solving the Problem of Small Non-Preferential Base Run Imports in an Armington Approach. Paper to be presented at the IATRC Summer Symposium 2005, Seville, Spain.

WTO (2003). Negotiations on Agriculture: First Draft of Modalities for further Commitments, Revision. TN/AG/W/1/Rev.1, WTO: Geneva.

WTO (2004a). Doha Work Programme, Decision Adopted by the General Council on 1 August 2004. WT/L/579, WTO: Geneva.

WTO (2004b). WTO Agriculture Negotiations: The Issues, and where we are now. WTO Briefing Document, Version 1 December 2004, WTO, Geneva.